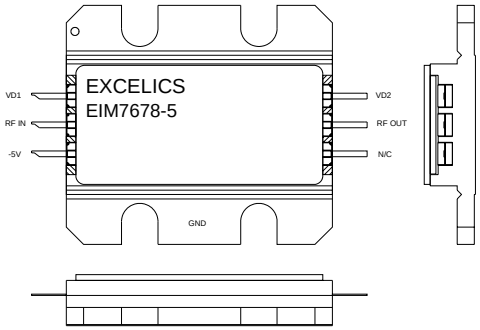
EIM7678-5

ISSUED 08/11/2008

7.6 – 7.8 GHz Multi-Stage Power Amplifier

FEATURES

- **7.6– 7.8GHz Operating Frequency Range**
- **37.0dBm Output Power at 2dB Compression**
- **31.0 dB Typical Power Gain @2dB gain compression**
- **Non-Hermetic Metal Flange Package**



APPLICATIONS

- **Point-to-point and point-to-multipoint radio**
- **Military Radar Systems**

Caution! ESD sensitive device.

ELECTRICAL CHARACTERISTICS (Tb = 25 °C, 50 ohm, VD1=7V, VD2=10V, Vgg=-5V)

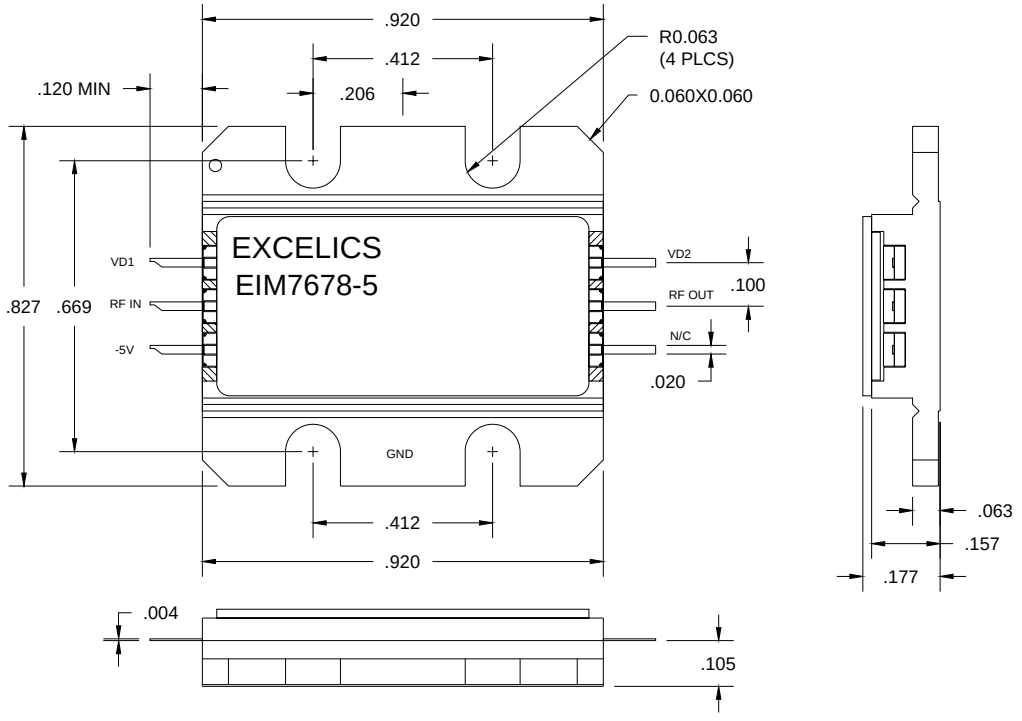
SYMBOL	PARAMETER/TEST CONDITIONS	MIN	TYP	MAX	UNITS
F	Operating Frequency Range	7.6		7.8	GHz
P2dB	Output Power at 2dB Gain Compression	36.0	37.0		dBm
G2dB	Gain @2dB gain compression	29	31		dB
ΔGain	Gain Flatness		±1.0		dB
Input RL	Input Return Loss		-12	-8	dB
Output RL	Output Return Loss		-15	-10	dB
VD1	Drain Supply Voltage 1		7		V
VD2	Drain Supply Voltage 2		10		V
I_{DQ1}	Quiescent Drain Current 1		200		mA
I_{DQ2}	Quiescent Drain Current 2		2600	3000	mA
Vgg	Gate Supply Voltage		-5		V
Rth	Thermal Resistance		2.4		°C/W
Tb	Operating Base Plate Temperature	- 30		+ 80	°C

MAXIMUM RATINGS @25°C[1,2]

SYMBOL	CHARACTERISTIC	ABSOLUTE	CONTINUOUS [1,2]
V_{D1}	Drain Supply Voltage 1	12V	8V
V_{D2}	Drain Supply Voltage 2	14V	10V
V_{gg}	Gate Supply Voltage	-10V	-6 V
I_{gg}	Gate Current	150mA	50 mA
P_{IN}	Input Power	20dBm	@ Pout 2dB compression
T_{CH}	Channel Temperature	175°C	175°C
T_{STG}	Storage Temperature	-65/175°C	-65/175°C
P_T	Total Power Dissipation	37.5W	37.5W

Notes: 1. Operating the device beyond any of the above rating may reduce MTTF and cause permanent damage.
2. Bias conditions must also satisfy the following equation Vdd*Idd < (T_{CH} –Tb)/R_{TH}

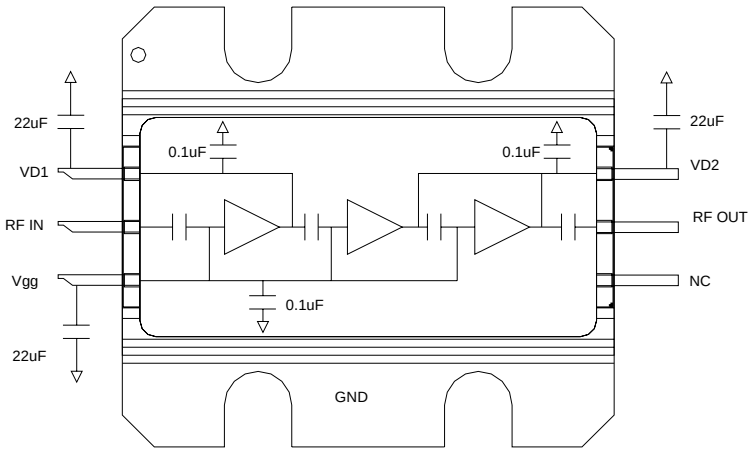
Package Dimension and Pin Assignment



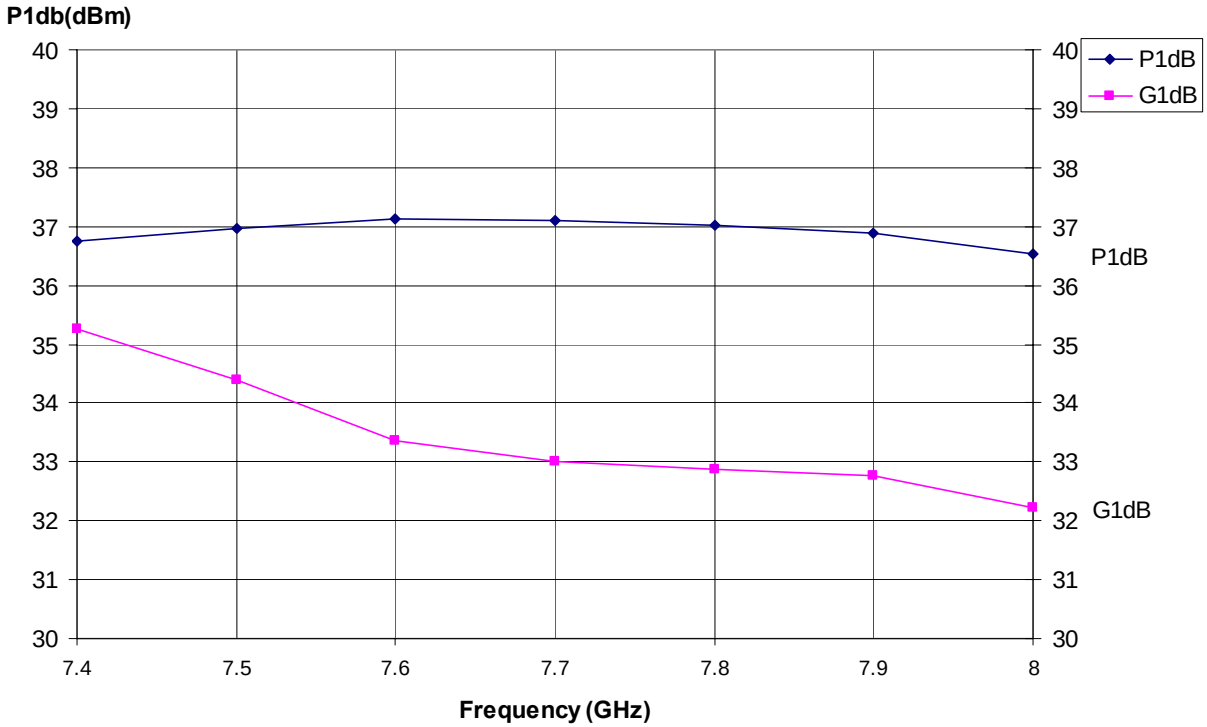
Dimensions are in inches
* NC: No connection inside the package

Application Note

1. **The package should be screwed onto a good heat sink and ground**
2. **Turn on/off sequence is required:**
   ---to turn on: apply -5V first, then +7V and +10V.
   ---to turn off: turn +7V and +10V off first, then turn -5V off
3. **Recommended External Bias Circuit and Internal Block Diagram**



Typical Performance: P1dB & G1dB (@Vds=10.0V, Idsq=2700mA)



S-PARAMETERS (V_{D1}=10V, I_{DQ1} =2700mA, V_{D2}=7V, I_{DQ2} =180mA)

Freq	S11		S21		S12		S22	
GHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
6.0	0.2739	-126.02	7.8680	157.28	0.0038	78.75	0.1621	-92.98
6.2	0.2135	-143.95	14.1273	65.93	0.0025	-121.90	0.1503	-121.39
6.4	0.1461	-152.50	23.4034	-28.46	0.0025	-128.06	0.1000	-153.57
6.6	0.1155	-139.22	35.9707	-127.90	0.0027	-59.16	0.0534	-49.77
6.8	0.1449	-135.08	47.3280	129.69	0.0017	45.82	0.1889	-85.17
7.0	0.1663	-148.04	53.8634	28.59	0.0033	45.58	0.2179	-128.72
7.2	0.1563	-151.11	53.5623	-69.47	0.0004	103.89	0.1500	-142.99
7.4	0.1880	-153.11	49.5049	-160.95	0.0017	-99.64	0.1878	-135.61
7.6	0.2437	-170.31	46.4079	112.81	0.0045	-20.74	0.2598	-156.35
7.8	0.2399	159.50	44.4597	23.45	0.0038	149.12	0.2348	171.42
8.0	0.1948	142.63	37.8991	-63.19	0.0029	158.82	0.1796	163.79
8.2	0.1805	138.04	32.6948	-142.76	0.0029	24.78	0.1824	165.68
8.4	0.1789	127.05	31.7834	139.44	0.0068	59.47	0.2126	154.82
8.6	0.1849	110.83	33.6484	55.37	0.0014	23.03	0.2254	144.31
8.8	0.1373	85.62	34.7505	-39.89	0.0040	-81.51	0.2497	130.34
9.0	0.0932	91.29	29.2272	-139.08	0.0036	-81.65	0.2166	108.53